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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/024,905

12/18/2001

Chang-Hee Lee

005489.P009

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02/12/2004

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EXAMINER

SONG, SARAH U

ART UNIT

PAPER NUMBER

2874

DATE MAILED: 02/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/024,905	Applicant(s) LEE ET AL.	
	Examiner Sarah Song	Art Unit 2874	<i>AW</i>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-40 and 43-46 is/are pending in the application.
- 4a) Of the above claim(s) 1-3 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4-32, 43 and 44 is/are allowed.
- 6) ☒ Claim(s) 33-40, 45 and 46 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1203</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's communication filed on December 16, 2003 has been carefully considered and placed of record in the file. Claims 1-3, 41 and 42 have been canceled. Claims 4-40 and 43-46 are pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 33-40 and 45-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. (U.S. Patent 6,266,462 previously relied upon).** Kim et al. discloses an apparatus comprising means for receiving an optical signal (signal light) in an optical waveguide 12; and means for generating a set of acoustic waves at N number (e.g. 3) of frequencies (f1, f2, and f3) which correspond to N number of optical wavelengths (see figure 15a for example, column 11, lines 57-61 and column 12, last paragraph). The set of acoustic waves cause the optical signal to couple from a first mode (core mode) to a second mode (cladding mode). Kim et al. additionally discloses that transmittance is dependent on amplitude (column 12, lines 33-37). Figure 15(a) for example shows a reduction in transmittance at 74, 75 and 76. Kim et al. does not expressly teach that each acoustic wave in the set of acoustic waves has an amplitude that correlates to a reduction of optical power in the N number of optical wavelengths. It would have been within the level of ordinary skill to recognize that the reduction in transmittance is related to a reduction in optical power. Therefore, it would have been obvious to one having

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ordinary skill in the art that the reduction of transmittance for each of three wavelengths shown by Kim et al. in Figure 15(a) is equivalent to the claimed limitation for the set of acoustic waves having an amplitude that correlates to a reduction of optical power in the N number of optical wavelengths since Kim et al. discloses that the transmittance is dependent on the amplitude of the of the acoustic wave.

4. The means for shaping a transmission spectrum by applying the set of acoustic waves to the optical waveguide is evident from Figures 11 and 15(a).

5. Regarding method claims 33-35, the method is also obvious as setting forth requisite steps for operation of the apparatus as discussed in the preceding paragraphs with regard to the apparatus. Regarding claim 35, it appears from Figures 15(a) and (b), that the set of waves are synchronously transmitted to shape the spectrum as shown in Figure 15(b).

6. Regarding claim 36, Kim et al. additionally discloses a core 14, cladding 16, a first interaction region 36, an acoustic wave exciter 24 affixed to the first interaction region. Kim et al. does not expressly teach that the acoustic wave exciter sweeps a bandpass of wavelengths across a wavelength spectrum. It is noted that the acoustic wave exciter of Kim et al. is tunable, and therefore, inherently comprises the ability to so perform. Furthermore, as noted above, Kim discloses that the transmission spectrum can be shaped by applying a set of acoustic waves, and therefore, one of ordinary skill in the art would have found it obvious at the time of the invention to sweep a bandpass of wavelengths to shape the entirety of the spectrum.

7. Regarding claims 37 and 38, Kim et al. discloses a second acoustic wave exciter cascaded in series along the waveguide with the first acoustic wave exciter and affixed to a second interaction region. See Figure 20(a).

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8. Regarding claim 39, Kim et al. does not expressly teach a polarization dependence of less than two tenths of a decibel. It would have been obvious to one having ordinary skill in the art at the time the invention was made to minimize the polarization dependence, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

9. Regarding claim 40, control components are well known in the art. It would have been additionally obvious to provide a control component to synchronize the generation of the responses in view of Kim et al. to shape the transmission spectrum in its entirety with efficiency and accuracy.

Allowable Subject Matter

10. Claims 4-32, 43 and 44 are allowed.

11. The following is a statement of reasons for the indication of allowable subject matter: Claims 4-32, 43 and 44 are allowable for the reasons indicated in the previous Office action.

Response to Arguments

12. Applicant's arguments filed December 16, 2003 have been fully considered but they are not persuasive. Applicant states that Kim et al. is silent with respect to the claimed limitation for a set of acoustic waves having an amplitude that correlates to a reduction of optical power in the N number of optical wavelengths. Examiner respectfully disagrees. Although Kim et al. does not expressly teach the claimed limitation, the feature would have been obvious to one having ordinary skill in the art in view of the teachings provided by Kim et al. Kim et al. discloses that transmittance is dependent upon the amplitude of a RF signal and thus the amplitude of the acoustic wave, that the coupled wavelength is determined by the frequency of the RF signal and

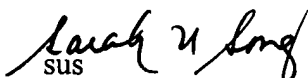
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thus the frequency of the acoustic wave. Furthermore, it is well known to one of ordinary skill in the art that a reduction in transmittance corresponds to a reduction in optical power. Figure 15(a) for example, clearly shows the 3 wavelengths at which optical power is reduced. One of ordinary skill in the art would have recognized the reduction in optical power would have been due to the 3 acoustic waves at respective frequencies and amplitudes resulting from the 3 RF signals. Therefore, the claimed limitation would have been obvious to one having ordinary skill in the art.

13. Regarding claim 36, it is noted that claim 36 is a device claim. Therefore, the method limitation for generating multiple band rejection responses to create a transmission spectrum is not germane to the issue of patentability of the device. Regardless, it appears that the apparatus of Kim et al. is fully capable of performing the function of generating multiple band rejection responses to create a transmission spectrum.

Conclusion

14. Any inquiry concerning the merits of this communication should be directed to Examiner Sarah Song at telephone number 571-272-2359. Any inquiry of a general or clerical nature, or relating to the status of this application or proceeding should be directed to the receptionist at telephone number 571-272-1562 or to the technical support staff supervisor at telephone number 571-272-1615.


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Brian Healy
Primary Examiner